

CLAIMS

What is claimed is:

1. An overhead rail system for supporting and/or energizing a plurality of utilitarian elements which cooperate so as to form a commercial interior primarily depending downwardly from a plane of said rail system, said rail system comprising:
 - at least one primary track having an elongated configuration;
 - electrical energizing means coupled to said primary track, for providing electrical power signals along said elongated configuration;
 - said utilitarian elements comprise a set of vertically disposed partitions;
 - partition connecting means positioned along said track for removably and vertically supporting said partitions along said elongated configuration;
 - said utilitarian elements further comprise a set of electrically energized devices;
 - electrical connection means positioned along said track for interconnecting said electrically energized devices to said electrical energizing means; and
 - said partition connecting means and said electrical connection means are coupled to said track, and to said vertically disposed partitions and electrically energized devices, respectively, so as to facilitate reconfiguration and relocation of said utilitarian elements as required by users of said commercial interior.
2. An overhead rail system in accordance with claim 1, characterized in that said electrical energizing means is structured so as to provide said electrical power signals substantially along a continuum of said elongated configuration.
3. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises communication means coupled to said primary track, for receiving and transmitting communication signals along said elongated configuration.

4. An overhead rail system in accordance with claim 3, characterized in that said communication means is structured so as to provide reception and transmission of said communication signals substantially along a continuum of said elongated configuration.

5. An overhead rail system in accordance with claim 3, characterized in that: said utilitarian elements further comprise at least one controlling device; said utilitarian elements further comprise at least one controlled device, said controlled device having at least first and second states; and said communication signals are utilized to effect a logical control relationship between said controlling device and said controlled device.

6. An overhead rail system in accordance with claim 5, characterized in that said logical control relationship between said controlling device and said controlled device is reconfigured at least in part with said communication signals, in the absence of any physical relocation of any physical wiring associated with said controlling device and said controlled device.

7. An overhead rail system in accordance with claim 5, characterized in that said rail system comprises at least one manually operable programming means for transmitting programming signals so as to effect said logical control relationship.

8. An overhead rail system in accordance with claim 7, characterized in that said programming means comprises a hand-held wand.

9. An overhead rail system in accordance with claim 5, characterized in that said rail system further comprises control means coupled to said communication means and to said controlled device, and responsive to said communication signals so as to effect said logical control relationship.

10. An overhead rail system in accordance with claim 9, characterized in that: said rail system further comprises at least one manually operable programming means for transmitting programming signals so as to effect said logical control relationship; and

said control means comprises sensor means responsive to said programming signals for generating control signals and effecting said logical control relationship.

11. An overhead rail system in accordance with claim 10, characterized in that said control means is coupled to said communication means so that said control signals are generated at least partially in response to said communication signals.

12. An overhead rail system in accordance with claim 1, characterized in that said partition connection means and said electrical connection means are structured so that at least certain of said utilitarian elements are manually releasable from said partition connection means and said electrical connection means.

13. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises a plurality of primary tracks, with at least a first set of said plurality of primary tracks extending along a single axis, with each of said first set of primary tracks interconnected to adjacent ones of said first set of said primary tracks.

14. An overhead rail system in accordance with claim 1, characterized in that said electrical energizing means comprises a set of electrical buses, positioned within said primary track, and extending along said elongated configuration.

15. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises low voltage/DC means coupled to said primary track, for generating relatively low voltage or DC electrical signals along said elongated configuration.

16. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises low voltage/communication means coupled to said primary track, for providing low voltage or DC signals along said elongated configuration, and/or receiving and transmitting communication signals along said elongated configuration.

17. An overhead rail system in accordance with claim 3, characterized in that said communication means is located within said primary track, said electrical energizing means is located within said primary track, and said electrical energizing means and said communication means are physically and electrically isolated from one another.

18. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises an enclosed raceway electrically isolated from said electrical energizing means and adapted to carry high voltage electrical cables or wires along said elongated configuration.

19. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises a cable tray removably mounted at an upper portion of said primary track, and adapted to carry power cables or communication cables.

20. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises:

a plurality of primary tracks; and
support means coupled to upper portions of said primary tracks and to a building structure of said commercial interior, for releasably supporting said primary tracks from said building structure.

21. An overhead rail system in accordance with claim 20, characterized in that

said support means comprises means for adjusting the distance of a plane of said primary tracks from a floor of said building structure.

22. An overhead rail system in accordance with claim 1, characterized in that:
said primary track comprises a back half assembly forming a part of said elongated configuration;

said primary track further comprises a front half assembly forming a part of said elongated configuration, said front and back half assemblies being manufactured as physically separate elements, and when mated together form a part of said primary track with a lower spacial area therewithin;

said electrical energizing means comprises elongated electrical power buses adapted to be mounted within said lower spacial area formed by said back half and said front half assemblies; and

said manufacture of said front and said back half assemblies as physically separate elements functions so as to permit positioning of said elongated electrical power buses within said lower spacial area prior to said back and said front half assemblies being coupled together, thereby permitting said elongated buses to be positioned within said spacial area without requiring said elongated buses to be slid through an end of said primary track into said lower spacial area.

23. An overhead rail system in accordance with claim 1, characterized in that:
said primary track comprises a back half assembly forming a part of said elongated configuration;

said primary track further comprises a front half assembly forming a part of said elongated configuration, said front and back half assemblies being manufactured as

physically separate elements, and when mated together form a part of said primary track with a lower spacial area therewithin;

said rail system further comprise elongated low voltage, DC or communication buses adapted to be mounted within said lower spacial area formed by said back half and said front half assemblies; and

said manufacture of said front and said back half assemblies as physically separate elements functions so as permit positioning of said low voltage, DC or communication buses within said lower spacial area prior to said back and said front half assemblies being coupled together, thereby permitting said elongated low voltage, DC or communication buses to be positioned within said spacial area without requiring said elongated buses to be slid through an end of said primary track into said lower spacial area.

24. An overhead rail system in accordance with claim 22, characterized in that said primary track further comprises an elongated cover, said cover being adapted to be coupled to said back half assembly and said front half assembly, so as to form an upper raceway within said primary track.

25. An overhead rail system in accordance with claim 24, characterized in that said cover comprises apertures through which electrical means may be extended so as to electrically interconnect said electrical means to electrical cables or wires extending through said upper raceway.

26. An overhead rail system in accordance with claim 1, characterized in that: said primary track comprises a spacial area forming an upper raceway through which electrical cables or wires are extended;

said rail system further comprises at least one rail cap for enclosing an end of said primary track, while still permitting access to electrical power signals; and

said rail cap further comprises means for providing strain relief for wires or cables extending through apertures of said rail cap.

27. An overhead rail system in accordance with claim 1, characterized in that:

said primary track comprises first and second sets of elongated sections adapted to be interconnected together so as to form a part of said elongated configuration of said primary track;

said elongated sections are staggered so that ends of each of said first set of elongated sections are positioned intermediate ends of said second set of elongated sections, when said first set of elongated sections are interconnected to said second set of elongated sections; and

said staggered relationship is such that ends of each of said second set of elongated sections are positioned intermediate ends of said first set of elongated sections when said first and second sets of elongated sections are interconnected together.

28. An overhead rail system in accordance with claim 1, characterized in that:

said primary track comprises an elongated back half assembly having a plurality of back half sections, each of said sections having a length X;

said primary track further comprises an elongated front half assembly having a plurality of front half sections, each of said front half sections having a length X;

said back half sections and said front half sections are interconnected together, so as to form a substantial portion of said primary track;

said interconnection of said back half sections and said front half sections occurs

with an end of each of said back half sections positioned substantially equidistant opposing ends of a corresponding one of said front half sections, and an opposing end of each of said back half sections being positioned substantially equidistant opposing ends of an adjacent one of said front half sections; and

said back and front sections are further interconnected together so that an end of each of said front half sections is positioned substantially equidistant opposing ends of a corresponding one of said back half sections, and an opposing end of each of said front half sections is positioned substantially equidistant opposing ends of an adjacent one of said back half sections.

29. An overhead rail system in accordance with claim 13, characterized in that at least certain of said primary tracks are spaced apart in parallel relationships, and form a substantially horizontal primary track plane.

30. An overhead rail system in accordance with claim 29, characterized in that said rail system comprises at least one cross-rail, adapted to be coupled between adjacent ones of said primary tracks.

31. An overhead rail system in accordance with claim 30, characterized in that said rail system comprises means for interconnecting said cross-rail to adjacent ones of said primary tracks, with such connection being substantially within said primary track plane of said primary tracks.

32. An overhead rail system in accordance with claim 30, characterized in that said overhead rail system comprises means for interconnecting said cross rail to parallel and adjacent ones of said primary tracks, so that said cross rail is positioned in a plane located below said primary track plane of said adjacent ones of said primary tracks.

33. An overhead rail system in accordance with claim 30, characterized in that said rail system comprises means for interconnecting said cross-rail to adjacent and parallel ones of said primary tracks, so that said cross-rail is positioned in a perpendicular configuration relative to said adjacent ones of said primary tracks.

34. An overhead rail system in accordance with claim 30, characterized in that said rail system comprises means for interconnecting said cross-rail to parallel and adjacent ones of said primary tracks, in a manner so that said cross-rail is in a non-perpendicular configuration, relative to said adjacent ones of said primary tracks.

35. An overhead rail system in accordance with claim 30, characterized in that said rail system further comprises:

electrical energizing means coupled to said cross-rail, for providing electrical power signals along an elongated configuration of said cross-rail;

a second set of vertically disposed partitions;

partition connecting means positioned along said cross-rail for removably and vertically supporting said second set of vertically disposed partitions along said elongated configuration of said cross-rail;

a second set of electrically energized devices;

electrical connection means positioned along said cross-rail for interconnecting said second set of electrically energized devices to said cross-rail electrical energizing means; and

said partition connecting means and said electrical connection means are coupled to said cross-rail, and to said vertically disposed partitions and electrically energized devices, respectfully, so as to facilitate reconfiguration and relocation of said vertically

disposed partitions and said electrically energized devices as required by users of spacial areas containing said cross-rail.

36. An overhead rail system in accordance with claim 30, characterized in that said cross-rail is releasably interconnectable to adjacent ones of said primary tracks.

37. An overhead rail system in accordance with claim 30, characterized in that said rail system comprises means for supporting ceiling panels on said primary tracks and a plurality of said cross rails.

38. An overhead rail system in accordance with claim 13, characterized in that said rail system further comprises connector means for releasably interconnecting adjacent ones of said primary tracks, so that said connected primary tracks are maintained in a longitudinal configuration.

39. An overhead rail system in accordance with claim 1, characterized in that:
said primary track forms a substantially enclosed upper raceway through which high voltage electrical cables may be extended; and

said primary track comprises a cover assembly having knock-out apertures spaced along the length of said cover assembly, so that power taps provided along the length of said high voltage cables within said upper raceway.

40. An overhead rail system in accordance with claim 3, characterized in that:
said electrical connection means comprises a power connector adapted to be releasably and electrically coupled to said electrical energizing means along a plurality of positions of said primary track; and

said power connector comprises communication connection means for releasably

and electrically coupling to said communication means, for providing said communication signals to certain of said utilitarian elements.

41. An overhead rail system in accordance with claim 1, characterized in that: said rail system further comprises low voltage energizing means coupled to said primary track, for providing low voltage or DC signals along said elongated configuration; and

said electrical connection means comprises at least one power connector adapted to be electrically coupled to said electrical energizing means for interconnecting at least certain of said utilitarian elements to said electrical energizing means so as to provide said low voltage or DC signals to certain of said utilitarian elements.

42. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises:

a plurality of said primary tracks;

a plurality of cross-rails, with said cross-rails mechanically coupled to adjacent ones of said primary tracks, and carrying cross-rail electrical energizing means coupled to said cross-rails, for providing electrical power signals along elongated configurations of said cross-rails; and

connector means for electrically coupling said electrical energizing means of said primary tracks to said cross-rail electrical energizing means.

43. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises:

a plurality of said primary tracks;

hanging means for supporting certain of said utilitarian elements, and where said

certain of said utilitarian elements comprise whiteboards requiring no interconnection with electrical power or data or communication signals.

44. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises:

- a plurality of primary tracks;
- mechanical means for releasably supporting certain of said utilitarian elements from said primary tracks;
- said certain of said utilitarian elements comprise an electronic whiteboard;
- communication means coupled to said primary tracks, for receiving and transmitting communication signals along said elongated configuration; and
- connection means for electrically coupling said communication means to said electronic whiteboard.

45. An overhead rail system in accordance with claim 1, characterized in that said rail system further comprises:

- a plurality of primary tracks;
- mechanical connection means for supporting certain of said utilitarian elements from said primary tracks;
- said certain of said utilitarian elements comprise a teleconferencing device;
- communication means coupled to said primary tracks, for receiving and transmitting communication signals along said elongated configuration; and
- connection means for electrically connecting said teleconferencing device to said electrical energizing means and to said communication means.

46. An overhead rail system for supporting and/or energizing a plurality of

utilitarian elements which cooperate so as to form a commercial interior primarily depending downwardly from a plane of said rail system, said rail system comprising;

a plurality of primary tracks, each of said tracks having an elongated configuration;

electrical energizing means coupled to said primary tracks, for providing electrical power signals along said elongated configurations;

communication means coupled to said primary tracks, for receiving and transmitting low voltage or communication signals along said elongated configuration;

said utilitarian elements comprise a plurality of vertically disposed partitions;

partition connecting means positioned along said primary tracks for removably and vertically supporting said plurality of partitions along said elongated configurations;

said utilitarian elements further comprise a plurality of electrically energized devices;

electrical connection means positioned along said primary tracks for removably and electrically interconnecting said electrically energizing devices to said electrical energizing means; and

said partition connecting means and said electrical connection means are coupled to said primary tracks, and to said vertically disposed partitions and electrically energized devices, respectfully, to as to facilitate reconfiguration and relocation of said utilitarian elements as required by users of said commercial interior, in the absence of any substantial physical relocation of any physical wiring associated with said rail system and said utilitarian elements.

47. An overhead rail system in accordance with claim 46, characterized in

that:

said utilitarian elements further comprise at least one controlling device;

said utilitarian elements further comprise at least one controlled device, said controlled device having at least first and second states;

said communication signals are utilized to effect a logical control relationship between said controlling device and said controlled device; and

said logical control relationship between said controlling device and said controlled device is effected with said communication signals in the absence of any physical relocation of any physical wiring associated with said controlling device and said controlled device.

48. An overhead rail system in accordance with claim 47, characterized in that said rail system comprises at least one manually operable and hand-held wand for transmitting programming signals so as to effect said logical control relationship.

49. An overhead rail system in accordance with claim 48, characterized in that:

said electrical energizing means comprises a set of electrical buses, positioned within said primary tracks, and extending along said elongated configurations;

said communication means comprises a set of communication buses, positioned within said primary tracks and located below said electrical buses, and extending along said elongated configuration;

said rail system further comprises an enclosed raceway formed at an upper portion of said primary tracks, and electrically isolated from said electrical buses and adapted to carry high voltage electrical cables or wires along said elongated configurations; and

said rail system further comprises a cable tray removably mounted above said enclosed raceway and adapted to carry electrical or communication cables.

50. An overhead rail system in accordance with claim 49, characterized in that:

each of said primary tracks comprises a back half assembly forming a part of said elongated configurations;

each of said primary tracks further comprises a front half assembly forming a part of said elongated configurations, said front and back half assemblies being manufactured as physically separate elements, and when mated together form a part of said primary tracks with lower spacial areas therewithin;

said electrical buses adapt to be mounted within said lower spacial areas formed by said back half and said front half assemblies; and

said manufacture of said front and said back half assemblies as physically separate elements functions so as to permit positioning of said elongated buses within said lower spacial areas prior to said back and said front half assemblies being coupled together, thereby permitting said elongated buses to be positioned within said spacial areas without requiring said elongated buses to be slid through ends of said primary tracks into said lower spacial areas.

51. An overhead rail system in accordance with claim 50, characterized in that said primary tracks further comprise elongated covers, said covers being adapted to be coupled to said back half assemblies and said front half assemblies, and so as to form said upper raceway within each of said primary tracks.

52. An overhead rail system in accordance with claim 51, characterized in that

interconnection of said front half and said back half assemblies is staggered so as to provide a strengthening function for said primary tracks.

53. An overhead rail system in accordance with claim 1, characterized in that said rail system comprises a universal clip for attaching utilitarian elements to the rail system, and where said universal clip facilitates reconfiguration.